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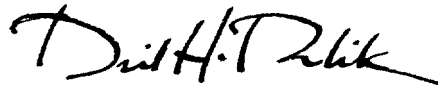
Re: Ex Parte Submission of Northpoint Technology, Ltd.  
ET Docket No. 98-206/RM-9147, RM-9245

Dear Ms. Salas:

In accordance with Section 1.206 of the Commission's rules, 47 CFR § 1.1206, this letter is written to notify you that Sophia Collier and Linda Rickman of Northpoint Technology, Ltd. ("Northpoint") met on August 31, 2000 with Dale Hatfield, Julius P. Knapp, Geraldine Matise, Thomas Derenge, Ira Keltz, Michael J. Marcus, Bruno Pattan, and Saj Durrani of the Commission's Office of Engineering and Technology. The Northpoint representatives discussed satellite and terrestrial sharing in the 12.2 - 12.7 GHz band and distributed copies of the enclosed presentation.

An original and six copies of this letter and its attachment are submitted for inclusion in the public record for the above-captioned proceedings. Please direct any questions concerning this submission to the undersigned.

Respectfully submitted,



David H. Pawlik  
Counsel for Northpoint Technology, Ltd.

cc: Dale Hatfield  
Julius P. Knapp  
Geraldine Matise  
Thomas Derenge  
Ira Keltz  
Michael J. Marcus  
Bruno Pattan  
Saj Durrani

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# **Issues for the 12 GHz Rulemaking Proceeding**

- Technical Sharing Rules in the 12 GHz Band

August 31, 2000

Northpoint Technology

# Technical Rules to Allow Sharing Among Services in the 12 GHz Band

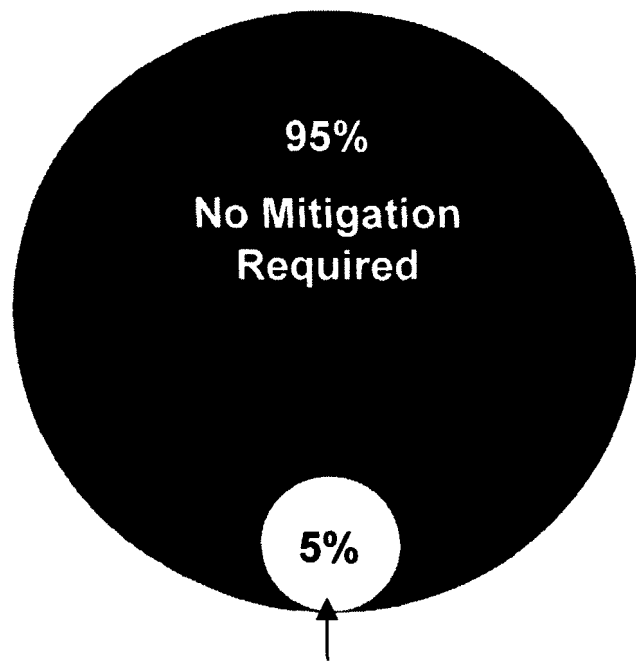
- Northpoint is committed to working to developing service rules that address legitimate DBS concerns to avoid excessive increases in consumer outages and provide a high level of protection to all DBS customers.
- In the technical record there are two DBS proposals:
  - One proposal attempts to use the NGSO criteria as a basis for Northpoint (Allocating 2.86% of the 10% NGSO interference budget to Northpoint)
  - The other is based on using a minimum Carrier to Interference (“C/I”) ratio
- Northpoint’s suggested standard for service rules:
  - Based on an assessment of actual consumer impact
  - Provides consumer protection against something that is serious enough to warrant regulatory action and does not impose an excessive burden on new entrants

## NGSO-Based Proposal Analysis

- While the NGSO-based proposal may have some appeal because it is based on rules under consideration for another service within the current rulemaking, it is unrealistic to apply this approach to Northpoint because Northpoint terrestrial services are fundamentally different from NGSO.
- The weakness of an NGSO-based proposal for Northpoint is that it sacrifices the interest of the many for the interests of a very, very few for whom a truly excessive amount of protection is provided.
- The NGSO-based approach is so stringent that, in large parts of the country, it would preclude deployment in communities that might have benefited from competitive services - just because a tiny fraction of DBS customers in these same communities might have greater than a three minute outage in an entire year!
- This is a long, long way from harmful interference.

# NGSO-Based Proposal Overview

## NGSO-based Proposal



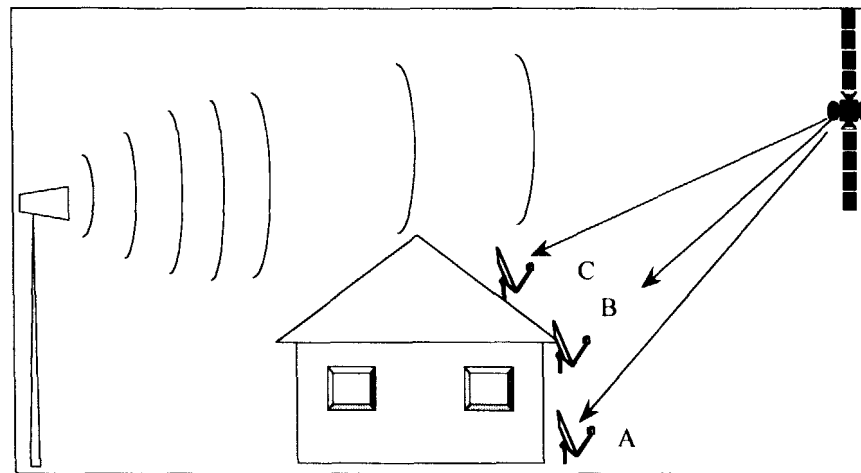
*Mitigate to the extent that no DBS customer has more than a theoretical 2.86% increase in "unavailability"*

Northpoint estimates that the NGSO-based proposal would impose a requirement to provide mitigation to DBS consumers in approximately 5% of its service area in order to reach the 2.86% criterion in the manner calculated by DBS.

To evaluate the NGSO-based proposal it is important to examine what benefits consumers in this 5% mitigation zone would receive from the 2.86% criterion and what costs would be borne by Northpoint and all other consumers.

## **Within the Proposed Mitigation Zone: 86% of All DBS Consumers Are Already Protected By Natural Shielding**

- Northpoint has documented that 86% of DBS customers have installed their dish in such a way that it is naturally shielded from the Northpoint signal.
- Therefore, within the mitigation zone, 86% of DBS customers already have natural shielding and only 14% of DBS customers in this 5% area – or 0.7% of all DBS customers – would have any exposure at all to the Northpoint signal.



**86% of Dish are installed as shown in positions A, B and C**

## Using the NGSO-based Criterion Overstates Outages by 100%

- Issue #1: The method used by DBS to calculate “unavailability” overstates actual consumer outages by about 100%.
  - DBS uses “operating threshold” values rather than “freeze frame” values to calculate DBS system “availability.” The “operating threshold” is NOT the “freeze frame” level when an outage actually occurs. Instead, it is the theoretical level at which error correcting codes begin to function.
  - Therefore, during part of the time that DBS calls “unavailable,” the consumer has a high quality picture and would NOT experience any outage whatsoever!
  - Based on the representative links provided to the ITU by DBS, this non-outage portion of the “unavailability” claimed by DBS equals approximately 50% of the total claimed “unavailability.” Thus 10 minutes of “unavailability” = only 5 minutes of outage.
- Asking Northpoint to protect a system that is not even exhibiting an outage is truly excessive and the definition of unnecessary.

# Full Pictures Are Available Even When DBS Says It Is “Unavailable”

Extract from current ITU database of BSS links provided as  
“representative” by the DBS industry.

BSS characteristics		Units	USA US-GSO 1(a)	USA US-GSO 1(b)
System Characteristics				
Frequency		GHz	12.7	12.700
Availability objective		%	99.92	99.94
Receiver noise Bandwidth		MHz	24	24.0
Modulation type			QPSK	QPSK
Polarization (angle as defined in Annex 2 of APS30 in case of linear polarization)			CL/CR	CL/CR
C/I due to frequency re-use (polarization discrimination)		dB		
C/I due to other GSO BSS networks		dB	20.7	23.7
C/I due to GSO FSS networks		dB	99.0	99.0
Clear sky feeder link C/N+I		dB	24.2	24.2
C/N+I required at operating threshold		dB	5	7.6
C/N+I required at the freeze frame performance point of the link (2)			3.5	6.1

Used to  
calculate  
availability



(2) When the high frequency of data errors causes the MPEG decoder to cease providing full pictures



## **In Order to Assess Consumer Impact One Must Consider How Television Is Viewed in the Home**

- Consumers cannot be harmed by outages that occur when their televisions are turned off. This percentage of time must be considered in assessing consumer impact.
  - According to A.C. Nielsen, television is on in the home for approximately 7 hours per day or 29% of a 24 hour period.
  - Since rain – the primary cause of outages – can occur at any time in a 24 hour day, it is essential to multiply any estimate of outages by a 29% viewing factor in order to reflect actual consumer experience.
  - Put another way, for any given outage the consumer has a 71% chance of not experiencing the outage at all because his or her television is turned off.
  - When the FCC considers rules it should assess realistic cases of consumer impact, not arbitrary percentages.

# What Does “2.86% in Increased Unavailability” Actually Mean for the Few Consumers Who Will Experience It?

- Consumers watch almost 2,600 hours of television a year or over 153,000 minutes.

BSS Link from ITU Database	DMA Rank	DMA	% of DBS Customers Impacted	Time Below Operating Threshold	Actual Outage Freeze Frame	After 29% Factor for Actual Viewing	Monthly minutes of increased outage
US-GSO D2(a)	1	New York	0.7%	14	8	2.3	0.19
US-GSO 4C6	2	Los Angeles	0.7%	24	11	3.3	0.28
US-GSO 4D2	3	Chicago	0.7%	21	13	3.8	0.32
US-GSO 4A3	7	Dallas	0.7%	38	27	7.9	0.66
US-GSO 4C5	11	Houston	0.7%	47	31	8.9	0.74
US-GSO 4C10	12	Seattle	0.7%	21	10	2.8	0.23
US-GSO D10(a)	15	Minneapolis	0.7%	33	16	4.5	0.38
US-GSO D1(a)	16	Florida (Miami)	0.7%	28	18	5.3	0.45
US-GSO 4A8	36	Salt Lake City	0.7%	3	1	0.4	0.03
US-GSO 4C9	37	San Antonio	0.7%	49	31	9.1	0.76
Average			0.7%	28	17	4.8	0.40

Selected links represent all U.S. cities within the ITU BSS database and show the link with highest number of minutes of “increased unavailability” as calculated by DBS among all links serving the DMA

## What Would Northpoint Need to Do In Order to Provide Mitigation to the 2.86% Limit?

- In order to protect to the 2.86% level for 0.7% of DBS customers, Northpoint would need to perform an additional 50,000 square miles of mitigation on a national basis, adding significantly to its system cost and rendering uneconomical deployment in low density rural areas where each incremental repeater has fewer and fewer customers, yet service is needed most.

BSS Link from ITU Database	Rank	DMA	Square Miles in DMA	% of DMA that is Inhabited	Repeaters needed for Inhabited area	Square miles of additional mitigation proposed by DBS	Monthly minutes of outage after additional mitigation	% of DBS Customers Impacted
US-GSO D2(a)	1	New York	12,059	95%	164	738	0.19	0.7%
US-GSO 4C6	2	Los Angeles	41,271	90%	531	2,390	0.28	0.7%
US-GSO 4D2	3	Chicago	10,469	90%	135	608	0.32	0.7%
US-GSO 4A3	7	Dallas	27,526	90%	354	1,593	0.66	0.7%
US-GSO 4C5	11	Houston	17,708	85%	215	968	0.74	0.7%
US-GSO 4C10	12	Seattle	25,097	80%	287	1,292	0.23	0.7%
US-GSO D10(a)	15	Minneapolis	41,235	70%	412	1,854	0.38	0.7%
US-GSO D1(a)	16	Florida (Miami)	4,117	90%	53	239	0.45	0.7%
US-GSO 4A8	36	Salt Lake City	136,689	30%	586	2,637	0.03	0.7%
US-GSO 4C9	37	San Antonio	31,887	50%	228	1,026	0.76	0.7%
Average						1,334	0.40	0.7%

Selected links represent all U.S. cities within the ITU BSS database and show the highest minutes of "increased unavailability" among all links serving the DMA

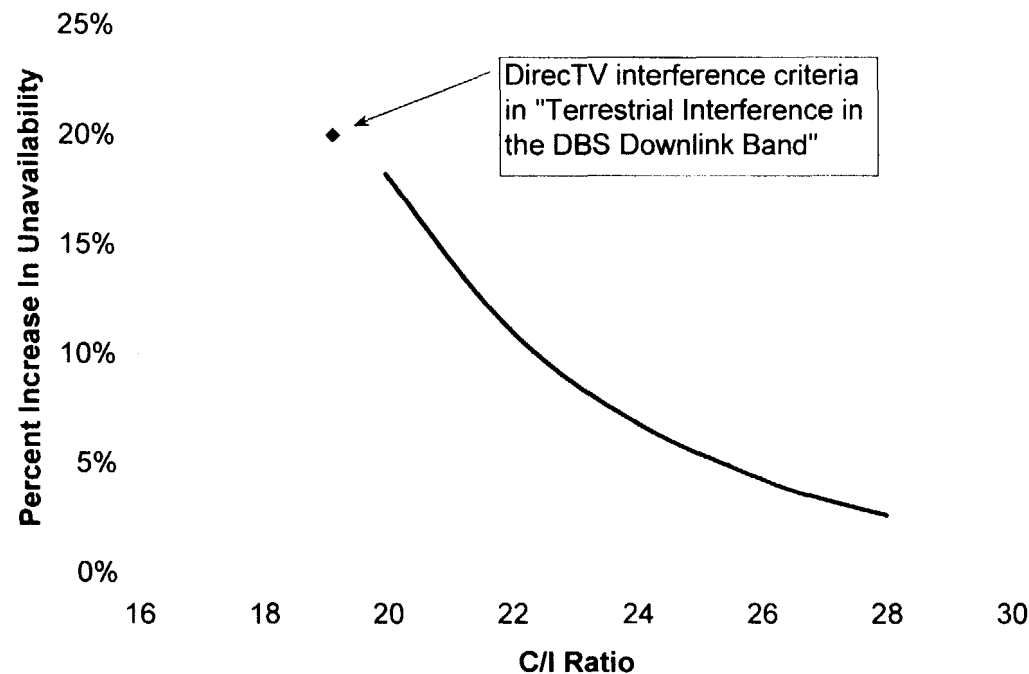
## **A Better Approach Using a C/I Ratio to Create an EPFD**

- Northpoint can address the legitimate DBS concern to avoid excessive increases in consumer outages and provide a high level of protection to all DBS customers by providing a minimum C/I protection. A C/I of 20 dB has been previously supported by DBS interests and can be implemented through an EPFD limit that would require mitigation below 20 dB.
- Benefits.
  - Provides an absolute threshold of protection.
  - Accounts for regional differences.
  - Provides greater average protection for all DBS consumers, not just excessive protection for a few.
  - Can be easily calculated and verified.
  - Similar to the way rules are currently written in Part 101 (Microwave).

## **Criteria the DBS Industry Previously Used for Sharing With Terrestrial Systems**

- DirecTV used a C/I ratio of 19 dB (a 20% increase in unavailability) in “Terrestrial Interference in the DBS Downlink Band,” (DirecTV, April 11, 1994).
- “Tempo believes the TI DBS report by DirecTV, which specified a C/I ratio of 19 dB, causing a reduction of 20% availability in subscriber systems is more accurate [as a standard for protection].” Comments of Tempo Satellite, Inc. in RM 9245, April 20, 1998, paragraph 5a.
- “Echostar estimates that a more acceptable Carrier-to-Interference level would be at least 20 dB (equal to the cross polarization isolation level of the Low Noise Block Down Converter with Integrated Feedhorn).” Opposition of Echostar Communications Corporation, RM 9245, April 20, 1998, page 9.

## Increase in “Unavailability” Calculated Using DBS Methods



As shown previously “increase in unavailability” only means “outage” a portion of the time. The minutes of actual outage were found to be only 50% of the total “unavailable” minutes in an examination of the links in the ITU DBS database.

## Validation Limit vs. Operational Protection

- The Northpoint power falls off rapidly after the 20 dB C/I contour, as shown below.
- The operational protection to DBS is much greater than this validation mask.
  - Natural shielding alone greatly increases protection to DBS.
- Under the Northpoint EPFD limit, 99.86% of the population are protected to the level to 28 dB.

C/I Ratio	Percent of Northpoint Service Area (Mask)	Operational Protection to Percent of Population*
Better than 20 dB	100%	100.00%
Better than 22 dB	99%	99.86%
Better than 28 dB	95%	99.3%

\*Accounts for 86% natural shielding

## What Does “C/I of 20 dB” Mean for the Few DBS Consumers Who Would Experience It?

BSS Link from ITU Database	DMA Rank	DMA	ANNUAL MINUTES			Monthly Minutes
			Additional Time Below Operating Threshold	Actual Outage Freeze Frame	After 29% Factor for Actual Viewing	
US-GSO D2(a)	1	New York	74	32	9	0.76
US-GSO 4C6	2	Los Angeles	171	61	18	1.48
US-GSO 4D2	3	Chicago	129	67	20	1.63
US-GSO 4A3	7	Dallas	244	149	43	3.60
US-GSO 4C5	11	Houston	274	148	43	3.57
US-GSO 4C10	12	Seattle	166	54	16	1.31
US-GSO D10(a)	15	Minneapolis	159	53	15	1.29
US-GSO D1(a)	16	Florida (Miami)	73	88	25	2.12
US-GSO 4A8	36	Salt Lake City	25	8	2	0.19
US-GSO 4C9	37	San Antonio	282	149	43	3.61
		Average	160	81	23	1.96

Selected links represent all U.S. cities within the ITU BSS database and show the link with highest number of minutes of “increased unavailability” as calculated by DBS among all links serving the DMA



## Comparison of NGSO-Based and C/I-Based Proposals – Minutes per Month

Under the C/I-based proposal a tiny fraction of consumers will experience the additional outage shown on the table – all other consumers will have an outage smaller than indicated.

BSS Link from ITU Database			MONTHLY		
	DMA Rank	DMA	NGSO- based proposal	C/I based proposal	Difference
US-GSO D2(a)	1	New York	0.19	0.76	0.6
US-GSO 4C6	2	Los Angeles	0.28	1.48	1.2
US-GSO 4D2	3	Chicago	0.32	1.63	1.3
US-GSO 4A3	7	Dallas	0.66	3.60	2.9
US-GSO 4C5	11	Houston	0.74	3.57	2.8
US-GSO 4C10	12	Seattle	0.23	1.31	1.1
US-GSO D10(a)	15	Minneapolis	0.38	1.29	0.9
US-GSO D1(a)	16	Florida (Miami)	0.45	2.12	1.7
US-GSO 4A8	36	Salt Lake City	0.03	0.19	0.2
US-GSO 4C9	37	San Antonio	0.76	3.61	2.8
		Average	0.40	1.96	1.6

It is highly unlikely that any consumer would actually be able to tell the difference between these two proposals. It is most likely that consumer would not notice any difference at all in either case - given that television is on in the home for an average of 7 hours a day or 12,775 minutes per month, an additional 1-3 minutes is trivial.

## Very Few Consumers Will Experience Increased Levels of Outages Under the C/I-Based Proposal

C/I Ratio	20-22	22-24	24-26	26-28	> 28
Minutes of outage C/I-based proposal	2.0	1.2	0.7	0.5	Less than 0.3
Minutes of outage NGSO-proposal	0.4	0.4	0.4	0.4	Less than 0.3
Difference (Minutes per Month)	1.6	0.8	0.3	0.1	-
% Population*	< 0.14%	< 0.19%	< 0.19%	< 0.19%	> 99.3%
Households**	< 105	< 142	< 142	< 142	> 74,475

\* Including effect of natural shielding only (mitigation for any consumer in 20 dB contour)

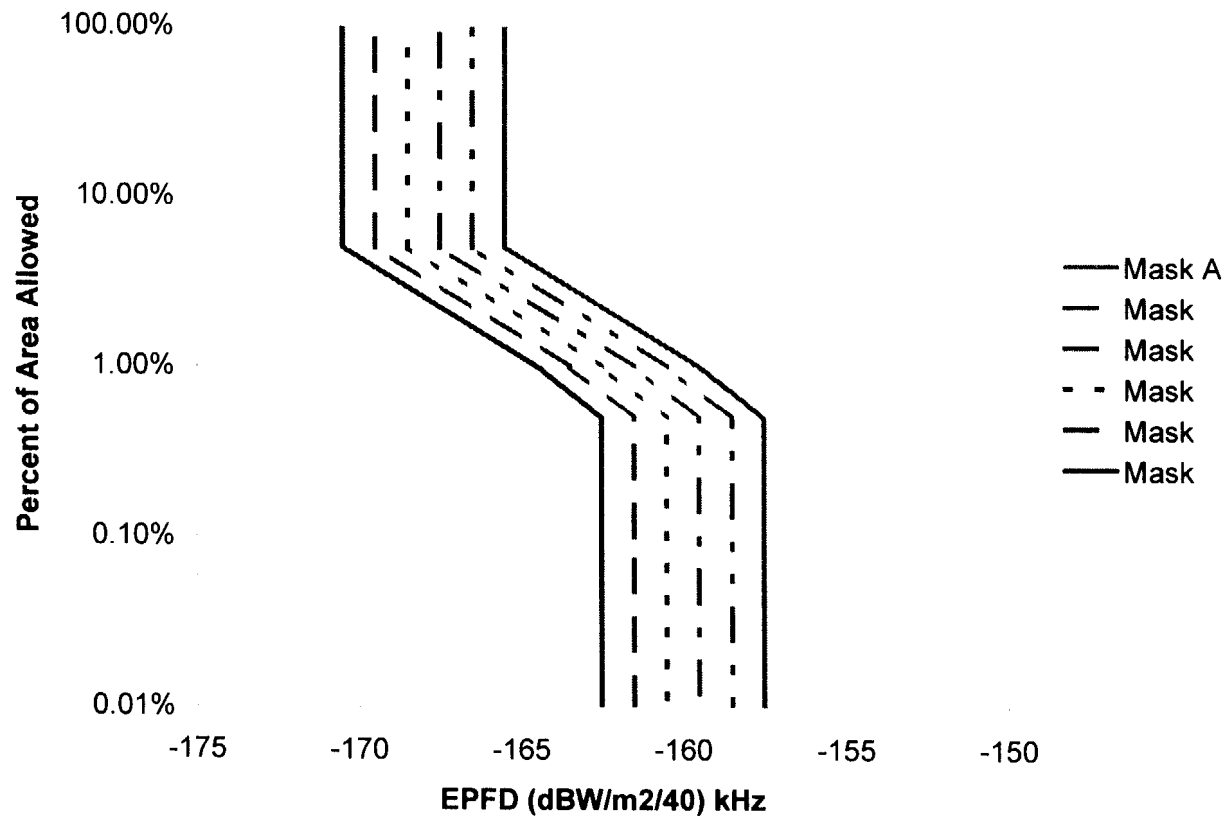
\*\* Average city of 500,000 households.

## Translating C/I levels to Power Levels to Create EPFD Limits

- An EPFD mask can be tailored for specific regions of the country to account for DBS signal power variances

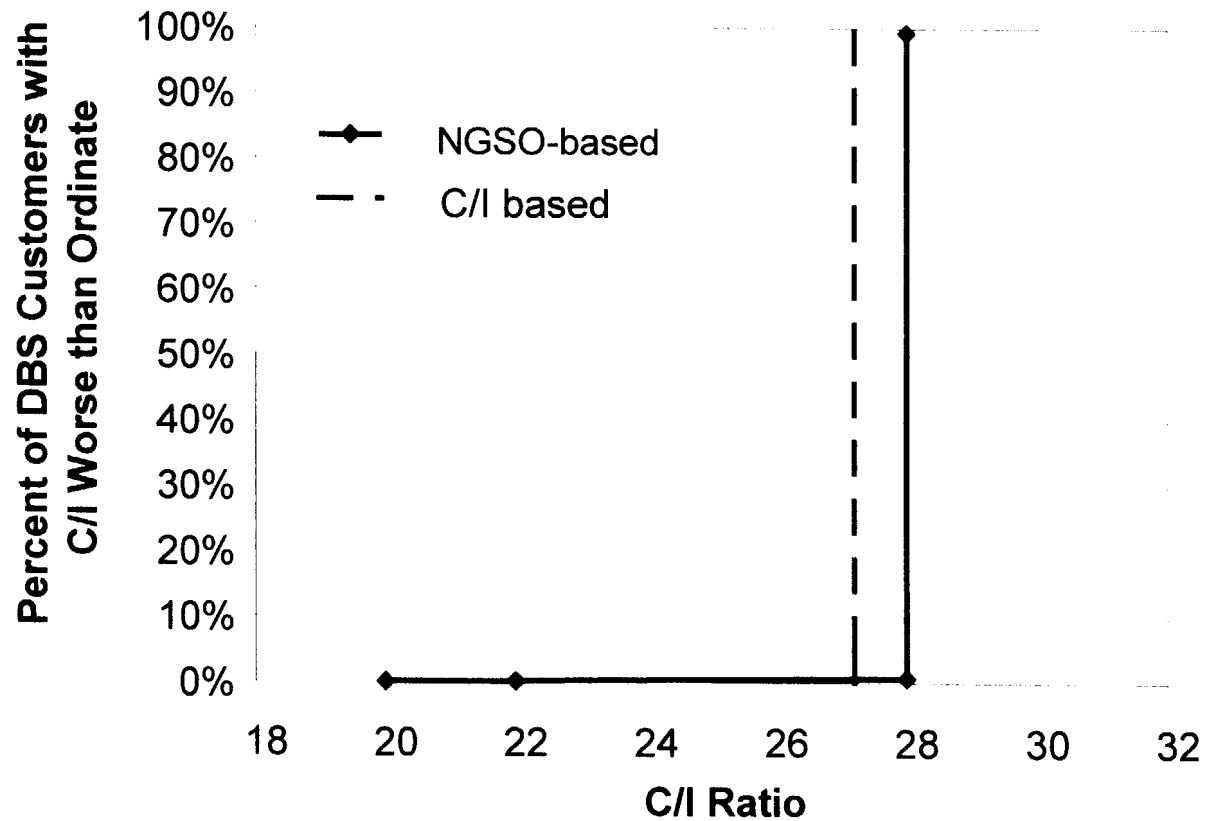
<b>Location</b>	<b>DBS Signal Power</b> (dBW/24 MHz)	<b>C/I ratio</b> (db)	<b>Interference Power</b> (dBW/24 MHz)	<b>EPFD</b> (dBW/m2/40 kHz)
Seattle	-124.9	20	-144.9	-163.5
Another area	-118.9	20	-138.9	-157.5

# The Northpoint Equivalent Power Flux Density Mask



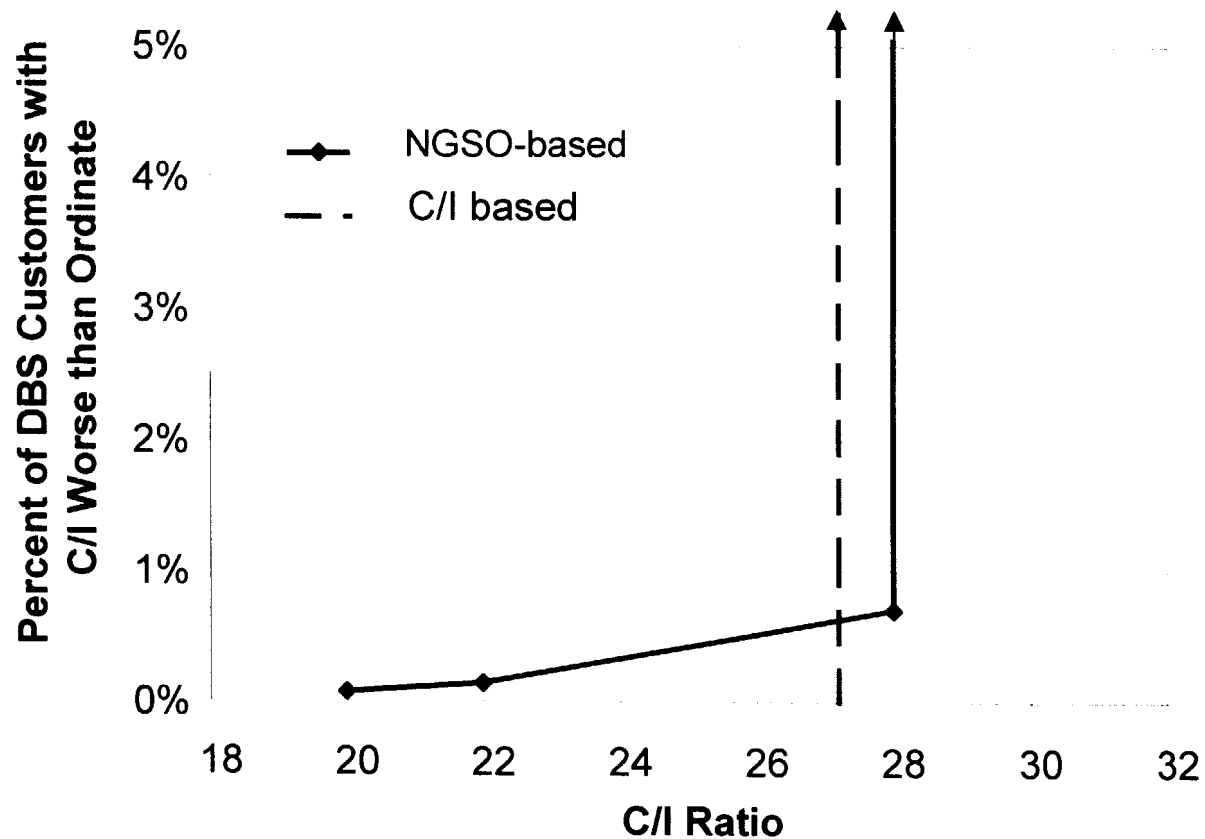
- Mask will vary to accommodate the range of DBS signal powers according to local conditions.

## Comparison of NGSO-Based and C/I Based Proposals



\*Operational protection provided by Northpoint EPFD Mask including the effect of natural shielding only.

## Comparison of NGSO-Based and C/I Based Proposals – Close Up View



\*Operational protection provided by Northpoint EPFD Mask including the effect of natural shielding only.

## Summary

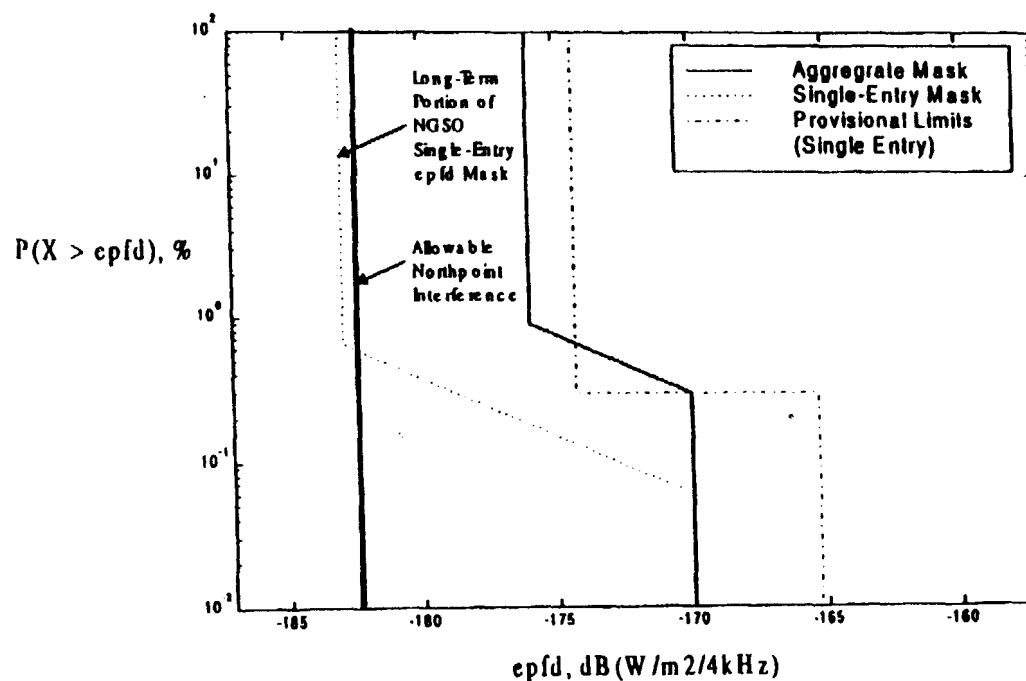
- The C/I based approach outlined in this report offers sufficient protection to DBS customers while not requiring an excessively large mitigation region and is thus greatly preferable to the NGSO-based proposal.
- This will enable Northpoint's Broadwave affiliates to deploy throughout the United States, including all of the Southwest, much of which would have been uneconomical under the NGSO-based plan.
- This will hasten new services to consumers including local signals to subscribers of satellite television services, broadband to rural areas and provide cable competition where there presently is little or none.

## Sample Conversion from C/I to EPFD

Percent of Area C/I not to be exceeded	100.0%	Units
DBS Carrier Power	-124.9	dBW/24 MHz
Allowable C/I	20	dB
Allowable Interference Power	-144.9	dBW/24 MHz
Bandwidth Conversion	-27.8	dB
Gain of 1 m2 antenna	43.2	dB-m2
Peak antenna gain	34	dBi
EPFD	-163.5	dBW/m2/40 kHz



# Comparison of Interference Criteria



**DIRECTV Proposed Limit for Northpoint Equals  
Long Term Portion Of DIRECTV Proposed NGSO Single Entry Mask**